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## PATENT SPECIFICATION



Application Date: May 25, 1940. No. 9252/40.

541,417

Complete Specification Left: May 26, 1941.

Complete Specification Accepted: Nov. 26, 1941.

### PROVISIONAL SPECIFICATION

#### Improvements in or relating to Yarn-winding and like Machines

We, FREDERICK HERBERT CLAYTON, a British Subject, of Greenleas, Butley Lane, Prestbury, Macclesfield, Cheshire, and BROCKLEHURST-WHISTON AMALGAMATED LIMITED, a British Company, of Ifurdsfield Mills, Macclesfield, Cheshire, do hereby declare the nature of this invention to be as follows:—

This invention is for improvements in or relating to yarn-winding and like machines of the type in which the winding spindle is driven at a constant angular speed and the supply package is rotated on a spindle by virtue of the tension applied to the thread being wound on the winding spindle.

In the operation of yarn-winding machines of the aforesaid type, one disadvantage encountered is that of obtaining uniformly wound packages. This is particularly the case when winding fine counts of silk, rayon or other yarns. If the yarn fed on to the winding spindle is too slack, the yarn sloughs off; if the yarn is too tight and the tension increases as the supply package empties, either the thread breaks or in the wound state is under too great a tension, thus overstressing the yarn.

It is the object of the present invention to provide a simple form of mechanism for controlling the supply of yarn or other fine thread in a winding machine of the aforesaid type in a manner such as to form uniformly-wound cops and other such packages.

According to the present invention, a yarn or like winding machine of the type described, comprises an element movable in response to change in diameter of the supply package, an element movable in response to change in the tension on the thread feeding to the winding spindle, and a braking device operatively connected to both of said elements and effective automatically to vary the angular speed of the supply package in accordance with the combined operative effect of the movement of one of said elements imposed upon the movement of the other of said elements.

In one embodiment of this invention there is provided a supply package

arranged for free rotation on a spindle and a cop-tube or winding spindle which is driven at a constant angular speed by suitable power means. Between the supply package and the cop-tube the thread to be wound passes over a floating pulley or its equivalent which, on variation in the tension on the thread, undergoes a translational movement in a direction depending upon whether the tension has increased or diminished. The pulley or its equivalent is secured to a pivoted arm (preferably spring-loaded) which participates in said movement.

Below the supply package, there is arranged a rockable support having an extension fixed to and actuated by said pivoted arm. A lightly loaded lever pivotally mounted on a part of the machine bears with rubbing or rolling contact on the surface of the supply package, being arranged to move angularly with change in diameter of the package. A brake-band of conventional type is secured at its ends respectively to the loaded lever and to the rockable support and is adapted frictionally to engage the lower side of the supply spindle or of a hub thereon.

The operation is as follows: With the thread feeding at normal tension from the supply package to the cop-tube, the floating pulley or its equivalent undergoes little or no translational movement and, as the diameter of the supply package diminishes, the loaded lever moves angularly downwards and moves the brake-band in a direction away from the supply spindle whereby with reduction in the braking effort the supply package is permitted to rotate at an increased rate, which varies proportionally with decrease in the package diameter. When substantial variation in thread tension occurs, the pulley or its equivalent is translated and, through the associated pivoted arm, causes the support connected with the arm to rock in an angular direction which depends upon whether the thread tension has decreased or diminished. With increase in tension, the support rocks away from the supply spindle and reduces the frictional contact of the brake-band with

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the supply spindle whereby the rotational speed of the supply package increases to reduce the tension on the thread. With decrease in the tension, the reverse effect occurs.

Due to the connection of the brake-band between the loaded lever and the rockable support, the effect on the supply spindle and hence on the supply package is the result of the combined operative effect of the movement of either the lever or the support imposed upon the movement of the other. In this way, a kind of balanced effect is obtained, which would not be the case had the loaded lever or an equivalent and the rockable support or an equivalent

been arranged for independent control of the thread supply.

It will be seen that with the use of a single braking mechanism it is possible in accordance with the invention to eliminate or at least to reduce irregularities in the winding which would otherwise occur whether due to change in supply package diameter or to change in tension in the thread fed to the winding spindle.

Dated this 25th day of May, 1940.

BOULT, WADE & TENNANT,  
111 & 112, Hatton Garden,  
London, E.C.1,  
Chartered Patent Agents.

#### COMPLETE SPECIFICATION

#### Improvements in or relating to Yarn-winding and like Machines

We, FREDERICK HUBERT CLAYTON, a British Subject, of Greenleas, Butley Lane, Prestbury, Macclesfield, Cheshire, and BROCKLEHURST-WHISTON AMALGAMATED LIMITED, a British Company, of Hurdsfield Mills, Macclesfield, Cheshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

This invention is for improvements in or relating to yarn-winding and like machines of the type in which the winding spindle is driven at a constant angular speed and the supply package is rotated on a spindle by virtue of the tension applied to the thread being wound on the winding spindle.

In the operation of yarn-winding machines of the aforesaid type, one disadvantage encountered is that of obtaining uniformly wound packages. This is particularly the case when winding fine counts of silk, rayon or other yarns. If the yarn fed on to the winding spindle is too slack, the yarn sloughs off; if the yarn is too tight and the tension increases as the supply package empties, either the thread breaks or in the wound state is under too great a tension, thus over-stretching the yarn.

It is the object of the present invention to provide a simple form of mechanism for controlling the supply of yarn or other fine thread in a winding machine of the aforesaid type in a manner such as to form uniformly wound cops and other such packages.

According to the present invention, a yarn or like winding machine of the type described, comprises an element (such as a contact arm) pivoted in fixed bearings and

movable in response to change in diameter of the supply package, an element (such as a pulley) carried on a lever pivoted in fixed bearings and movable in response to change in the tension on the thread feeding to the winding spindle, and a braking device operatively connected to both of said elements and effective automatically to vary the angular speed of the supply package in accordance with the combined operative effect of the movement of one of said elements imposed upon the movement of the other of said elements.

One embodiment of this invention comprises an arm pivoted on fixed bearings and bearing against the supply package, a lever pivoted on fixed bearings and having at its free end a pulley over which the thread leaving the supply package passes, a brake band acting upon the spindle of the supply package and a rockable support connected at its ends respectively to one end of the said brake band and to the said pivoted lever, the other end of the brake band being operatively connected to the said pivoted arm.

In the accompanying drawings, now to be described, there is diagrammatically illustrated an embodiment of the present invention, Figure 1 being an elevation and Figure 2 a corresponding plan view.

Referring to the drawings, the reference numeral 1 designates a yarn supply package arranged for free rotation on a spindle 2 and from which yarn feeds to a cop-tube or winding spindle (not shown) which is driven at a constant angular speed by suitable power means. Between the supply package 1 and the cop-tube the yarn or thread to be wound passes over a floating pulley 3 or its equivalent which, on variation in the tension on the thread, undergoes a translational movement in a

direction depending upon whether the tension has increased or diminished. The pulley or its equivalent is secured to a lever 4 (preferably spring-loaded) which 5 participates in said movement.

Below the supply package 1, there is arranged a rockable support 5 having an integral extension 6 fixed to and actuated by said lever 4. The support 5 is carried 10 by a fixed part of the machine (not shown) to which it is pivoted at 7 in fixed bearings so that the extension 6 and lever 4 are also pivoted at 7. The free end 8 of the support 5 is rolled to receive a rod 9 secured to a housing 10 rotatably supported by an extension 11 of the spindle 2. A lightly loaded contact arm 12 bearing with rubbing or rolling contact on the periphery of the supply package 1 is 15 secured to a shaft 13 mounted in lugs 14 upstanding from the support 5. Also secured to the shaft 13 is an adjustable lever 15 which thus works in unison with the arm 12. The shaft 13 is integral with 20 or secured to the pivot 7 of support 5 and thus has fixed bearings. To the lever 15 there is secured one end of a brake band 16, the other end of which is connected to the end 8 of the support 5, which brake 25 band is adapted frictionally to engage the lower side of a hub 17 on the spindle 2. The lever 15 has a series of holes therein so that the point of attachment of the brake band 16 can be adjusted as required. 30

The operation is as follows: With the thread feeding at normal tension from the supply package 1 to the cop-tube, the floating pulley 3 or its equivalent undergoes little or no translational movement 35 and, as the diameter of the supply package diminishes, the loaded arm 12 moves angularly downwards and moves the brake band 16 in a direction away from the supply spindle 2 whereby with reduction 40 in the braking effort the supply package 1 is permitted to rotate at an increased rate, which varies proportionally with decrease in the package diameter. When substantial variation in thread tension 45 occurs, the pulley 3 or its equivalent is translated and, through the associated arm 4, causes the support 5 connected with the arm 4 to rock about the pivot 7 in an angular direction which depends 50 upon whether the thread tension has increased or diminished. With increase in tension, the support 5 rocks away from the supply spindle 2 and reduces the frictional contact of the brake band 16 with the supply spindle hub 17 whereby the 55 rotational speed of the supply package 1 increases to reduce the tension on the thread. With decrease in the tension, the reverse effect occurs.

60 65 Due to the connection of the brake band

16 between the loaded arm 12 and the rockable support 5, the effect on the supply spindle 2 and hence on the supply package 1 is the result of the combined operative effect of the movement of either 70 the arm 12 or the support 5 imposed upon the movement of the other. In this way, a kind of balanced effect is obtained, which would not be the case had the loaded arm 12 or an equivalent and the 75 rockable support 5 or an equivalent been arranged for independent control of the thread supply.

It will be seen that with the use of a single braking mechanism it is possible in 80 accordance with the invention to eliminate or at least to reduce irregularities in the winding which would otherwise occur whether due to change in supply package diameter or to change in tension in the 85 thread fed to the winding spindle.

We are aware of the prior Specification No. 356,792 which shows a device in which a brake acting upon a supply package is 90 operated by a member which is controlled both by the tension in the yarn and also by the size of the supply package and we make no claim to anything disclosed in that Specification.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A yarn or like winding machine of 100 the type described which comprises an element (such as a contact arm) pivoted in fixed bearings and movable in response to change in diameter of the supply package, an element (such as a pulley) carried on a 105 lever pivoted in fixed bearings and movable in response to change in the tension on the thread feeding to the winding spindle, and a braking device operatively connected to both of said elements and effective automatically to vary the angular speed of the supply package in accordance with the combined operative effect of the movement of one of said elements imposed upon the movement of the other of said 115 elements.

2. A yarn or like winding machine as claimed in claim 1 which comprises an arm pivoted on fixed bearings and bearing against the supply package, a lever 120 pivoted on fixed bearings having at its free end a pulley over which the yarn or thread passes from the supply package, a brake band acting upon the spindle of the supply package and a rockable support to 125 one end of which one end of the brake band is secured and the other end of which support is secured to the said pivoted lever, the other end of said brake band being operatively connected to the said 130

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pivoted arm.

3. A yarn winding machine substantially as hereinbefore described with reference to the accompanying drawing.

Dated this 26th day of May, 1941.  
BOULT, WADE & TENNANT,  
111 & 112, Hatton Garden,  
London, E.C.1,  
Chartered Patent Agents.

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Fig. 1.

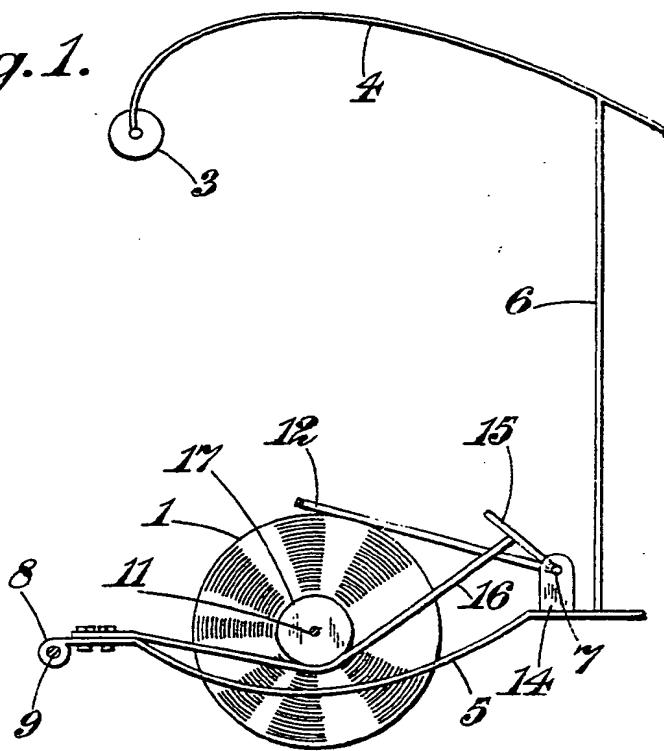
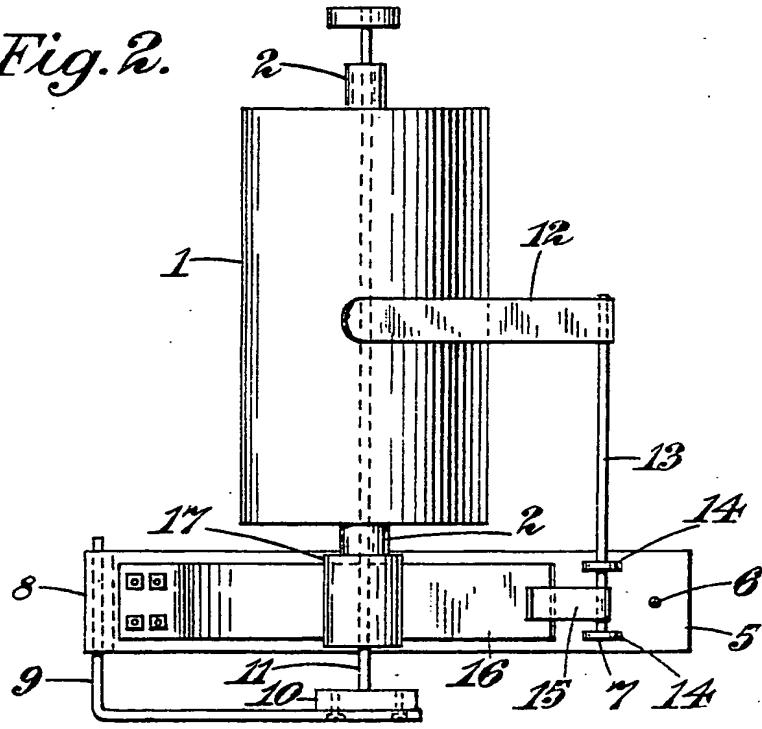


Fig. 2.



*[This Drawing is a reproduction of the Original on a reduced scale.]*

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